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| APPLICATION NO. | FILING DATE | FIRST NAMED INVENTOR | ATTORNEY DOCKET NO. | CONFIRMATION NO. |
|---|-------------|----------------------|---------------------|------------------|
| 10/667,802 | 09/22/2003 | Zhongmin Hu | SEMT116058 | 2157 |
| 26389 | 7590 | 04/18/2006 | EXAMINER | |
| CHRISTENSEN, O'CONNOR, JOHNSON, KINDNESS, PLLC 1420 FIFTH AVENUE SUITE 2800 SEATTLE, WA 98101-2347 | | | LEADER, WILLIAM T | |
| | | | ART UNIT | PAPER NUMBER |
| | | | 1742 | |

DATE MAILED: 04/18/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

| | | | |
|------------------------------|------------------------|---------------------|--|
| Office Action Summary | Application No. | Applicant(s) | |
| | 10/667,802 | HU ET AL. | |
| | Examiner | Art Unit | |
| | William T. Leader | 1742 | |

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 27 January 2006.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-27 is/are pending in the application.
- 4a) Of the above claim(s) 1-12 is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 13-27 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
 Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
 Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. _____ |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| Paper No(s)/Mail Date <u>1/26/04; 8/3/04</u> | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

1. Applicant's election with traverse of Group II, claims 13-27 in the reply filed on January 27, 2006 is acknowledged. The traversal is on the ground(s) that the bath claims of Group I are limited to a composition useful for depositing noble metal alloy onto a surface of a microelectronic workpiece. This is not found persuasive because a statement of intended use does not limit the recited composition to that particular use. Additionally, the search for a composition and a process using the composition are not necessarily coextensive.

The requirement is still deemed proper and is therefore made FINAL. Claims 1-12 are withdrawn from consideration.

Claim Rejections - 35 USC § 103

2. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

3. This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later

invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

4. Claims 13-27 are rejected under 35 U.S.C. 103(a) as being unpatentable over Andricacos et al (5,789,320) in view of Kohl (4,376,018) and Brenner *Electrodeposition of Alloys*.

5. The Andricacos et al patent is directed to a process for making small geometry gigabit scale dynamic random access memory (DRAM) microelectronic devices. The process includes the step of electroplating a noble metal or noble metal alloy to form electrodes (column 1, line 66 to column 2, line 1). A plating base (seed layer), which typically has a thickness of 300-2000 angstroms, but may be as thin as 30 angstroms, is first formed (column 2, lines 49-52). One of the procedures used to deposit the electrodes is a damascene process shown in figures 3f-3l. A masking layer is deposited on the substrate and patterned to form the features into which the electrode material is to be deposited, a seed layer is blanket coated onto the masking layer, the structure is blanket electroplated with the noble metal, and planarization is conducted by chemical mechanical polishing (column 5, line 61 to column 6, line 1). The plated noble metals include pure noble metals and alloys of noble metals with noble or non-noble metals. Examples include PtIr, PdPt and PdNi. The noble metals and second metals disclosed by Andricacos et al include metals recited in instant claims 14-18. See column 2, lines 9-12.

6. Instant claim 13 differs from the process of Andricacos et al by reciting that the plating bath is acidic. Andricacos et al discloses that the mask material may be diamond like carbon (DLC) and that DLC is resistant to strongly acidic solutions. See column 2, lines 59-65. Thus, Andricacos et al broadly suggests the use of an acidic plating bath but does not specifically

disclose the use of such a plating bath. The Kohl patent is directed to the electrodeposition of metals and alloys. The metals include noble metals such as gold, silver, palladium, platinum, and ruthenium. Non-noble metals include copper, nickel, cobalt, chromium, tin and lead. See column 1, lines 16-24. Several plating baths are listed in columns 5 and 6. Plating may take place at temperatures overlapping those recited in claims 25 and 27. Metal concentrations overlap those of claims 21-22. It is known to include sulfamic acid as recited in claim 24 (column 5, lines 26).

7. The Brenner text discloses the electrodeposition of alloys. Table 19-1 (pages 611-612) shows the deposition of the noble metal silver with other metals such as copper. The pH may be acidic. The table shows a relationship between the concentration of metals in the bath and in the deposited alloy. Temperatures may be in a broad range falling within the ranges recited. Table 19.4 shows the deposition of alloys of silver with metal of the iron group. Chapter 19 discusses the deposition of alloys of the platinum group metals.

8. The prior art or record is indicative of the level of skill of one of ordinary skill in the art. It would have been obvious at the time the invention was made to have utilized an acidic bath in the process of Andricacos et al because Andricacos et al suggest that the preferred DLC masking material may be used with acidic baths and, as shown by Kohl and Brenner, acid baths are effective in the deposition of metals. Kohl and Brenner show that the process parameters recited by applicant are result-effective variables recognized in the art. Choice of appropriate values for these parameters would have been a matter of routine optimization to one of ordinary skill in the art.

Art Unit: 1742

Any inquiry concerning this communication or earlier communications from the examiner should be directed to William T. Leader whose telephone number is 571-272-1245. The examiner can normally be reached on Mondays-Thursdays and alternate Fridays, 7:30-4:00.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Roy King, can be reached on 571-272-1244. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).



William Leader
April 14, 2006

ROY KING 
SUPERVISORY PATENT EXAMINER
TECHNOLOGY CENTER 1700